Application Serial No. 09/782,681

AMENDMENTS TO THE CLAIMS

1.   (Currently Amended) A computer implemented method for processing an online transaction, the method comprising the steps of:

5   generating from an online transaction of a purchaser, a plurality of keys from key fields of the transaction that individually do not reliably identify the purchaser;

      for each key, retrieving a profile of historical transactions associated with the key;

10   weighting each profile with a weight indicating a degree to which the profile is associated with current purchaser;

      generating a contrast measure using at least two of the profiles, and

      generating a fraud score using said contrast measure indicative of the likelihood of fraud in the online transaction as a function of the weighted profiles

15   and the current transaction.

2.   (Previously Presented) The method of Claim 1, wherein the key fields of the online transaction includes fields associated with any of purchaser identification information, order information, and payment information.

20.

3.   (Previously Presented) The method of Claim 1, wherein each profile for a key includes a plurality of summary variables derived from the associated historical transactions, and which summarize the historical transactions having the key in a key field of the historical transactions.

25

4.   (Previously Presented) The method of Claim 1, further comprising the step of:

2

using the fraud score to determine whether to obtain additional information prior to completing the transaction.

5.   (Previously Presented) The method of Claim 4, further comprising the
5   step of:

responsive to determining to obtain additional information, presenting a form with questions selected to obtain the additional information from the purchaser.

10   6.   (Previously Presented) The method of Claim 1, further comprising the step of:

using the fraud score to determine whether to hold the transaction for further review by a human analyst.

15   7.   (Previously Presented) The method of Claim 6, further comprising the step of:

responsive to determining to hold the transaction for further review, outsorting the transaction to a file for review by human analyst to determine whether to decline or approve the transaction, or obtain additional information
20   prior to completing the transaction.

8.   (Previously Presented) The method of Claim 1, further comprising the step of:

using the fraud score to determine whether to approve the transaction or
25   decline the transaction.

3

9.   (Previously Presented) The method of Claim 8, further comprising the step of:

responsive to determining to approve the transaction, completing the transaction order and fulfilling payment instructions for the order.

5

10.   (Previously Presented) The method of Claim 8, further comprising the step of:

responsive to determining to decline the transaction, transmitting a signal indicating that the transaction is declined.

10

11.   (Previously Presented) The method of Claim 8, wherein using the fraud score to determine whether to approve the transaction or decline the transaction further comprises the step of:

applying a plurality of rules to the fraud score and to the transaction.

15

12.   (Previously Presented) The method of Claim 8, wherein using the fraud score to determine whether to approve the transaction or decline the transaction further comprises the steps of:

storing velocity data based on an attribute of the transaction, the velocity
20   data measuring a frequency of the attribute in a plurality of transactions; and

applying a velocity rule to the velocity data.

13.   (Previously Presented) The method of Claim 8, wherein using the fraud score to determine whether to approve the transaction or decline the transaction
25   further comprises the step of:

4

declining the transaction if the fraud score is below a cutoff score, wherein the cutoff score is a function of a net margin of a merchant receiving the transaction.

5   14.   (Previously Presented) The method of Claim 8, wherein using the fraud score to determine whether to approve the transaction or decline the transaction further comprises the steps of:

for each of a plurality of different product categories, defining a different cutoff score; and

10   responsive to the product category pertaining to the transaction, applying the cutoff score for the product category to the fraud score.

15.   (Previously Presented) A method for developing a statistical model of online transactions, the method comprising the steps of:

15   storing from a plurality of different online merchants, transactions for a plurality of different purchasers, each transaction indicated as being fraudulent or non-fraudulent;

for each of a plurality of key fields of the transaction, including at least one key field for which all of the possible keys of the key field do not reliably identify a
20   purchaser of the transaction, generating for each key of the key field, a profile for all of the transactions having a matching key for the key field, such that at least one profile summarizes the transactions of a plurality of different individuals;

generating a contrast measure comparing the summary variables of at least two of the profiles; and

25   training a statistical model to generate a score for a transaction, the score indicative of a likelihood that the transaction is fraudulent, by using as training inputs to the statistical model selected transactions, the profiles associated with

the keys of the key fields of each selected transaction, and the contrast measures associated with the profiles.

16.   (Previously Presented) The method of Claim 15, further comprising the
5   steps of:

setting a cutoff score for rejecting a transaction by:

determining a desired transaction false positive rate as a function of a net margin:

selecting the score generated by the statistical model having an actual
10   transaction false positive rate substantially similar or identical to the desired transaction false positive rate.

17.   (Previously Presented) The method of Claim 16, wherein determining a desired transaction false positive rate as a function of a net margin comprises the
15   step of:

setting the transaction false positive rate TFPR according to the equation:

$$TFRP = \frac{1\text{-Net Margin}}{\text{Net Margin}}$$

18.   (Previously Presented) The method of Claim 15, wherein generating a
20   contrast measure comprises computing a ratio of the summary variables of the at least two profiles.

19.   (Previously Presented) A computer implemented method for processing an online transaction, comprising the steps of:

6

generating from the online transaction of a purchaser, a plurality of keys from key fields of the transaction that individually do not reliably identify the purchaser;

for each key, retrieving a profile of historical transactions associated with

5   the key, each profile including at least one summary variable;

computing at least one contrast measure for a summary variable included in the set of profiles; and

inputting the contrast measures, the online transaction data and the selected set of profiles into a predictive model to generate a fraud score

10   indicative of the likelihood of fraud in the online transaction.

20.   (Previously Presented) The method of Claim 19, wherein the key fields of the online transaction includes fields associated with any of purchaser identification information, order information, and payment information.

15

21.   (Previously Presented) The method of Claim 19, wherein each profile for a key includes a plurality of summary variables derived from the associated historical transactions, and which summarize the historical transactions having the key in a key field of the historical transactions.

20

22.   (Previously Presented) The method of Claim 19, wherein computing at least one contrast measure for a summary variable comprises computing a ratio of the summary variables of the profiles.

25   23.   (Previously Presented) The method of Claim 19, further comprising the steps of:

7

comparing the fraud score to a plurality of thresholds to determine whether to approve the transaction, decline the transaction, obtain more information for the transaction, or hold the transaction for further review by a human analyst;

responsive to determining to approve the transaction, completing the
5 transaction order, and fulfilling payment instructions for the online order, and completing the transaction;

responsive to determining to decline the transaction, transmitting to the purchaser/the merchant/ a signal indicating that the transaction is declined;

responsive to determining to obtain additional information that is
10 necessary to complete the transaction, presenting a form with questions selected to obtain the additional information from the purchaser; and

responsive to determining to hold the transaction for further review, outsorting the transaction to a file for review by human analyst to determine whether to decline, approve or obtain additional information.

15

24. (Previously Presented) The method of Claim 23, wherein comparing the fraud score to a plurality of thresholds comprises the steps of:

storing velocity data based on an attribute of the transaction, the velocity data measuring a frequency of the attribute in a plurality of transactions; and

20 applying a velocity rule to the velocity data.

25. (Previously Presented) The method of Claim 23, wherein comparing the fraud score to a plurality of thresholds further comprises the steps of:

for each of a plurality of different product categories, defining a different
25 cutoff score; and

responsive to the product category pertaining to the transaction, applying the cutoff score for the product category to the fraud score.

8

26. (Previously Presented) The method of Claim 25, wherein determining whether to decline the transaction further comprises the step of:

declining the transaction if the fraud score is below a cutoff score, wherein
5 the cutoff score is a function of a net margin of a merchant receiving the transaction.

27. (Previously Presented) The method of Claim 26, wherein the cutoff score as a function of a net margin comprises the step of:

10 setting the cutoff score to be a transaction false positive rate TFPR according to the equation:

$$TFRP = \frac{1\text{-Net Margin}}{\text{Net Margin}}$$

28. (Previously Presented) A computer implemented method for processing
15 transactions to statistically identify a current purchaser, comprising the steps of:

receiving a transaction;

generating from the transaction a plurality of keys, including keys containing keys that individually do not reliably identify the purchaser;

for each key, retrieving a profile summarizing historical transactions by
20 purchasers whose profiles match the key;

weighting each of the retrieved profiles by a weight indicating the degree to which the profile is associated with the current purchaser;

predicting the likelihood of fraud in the current transaction as a function of the weighted profiles and the current transaction.

25

9

29.   (Previously Presented) A computer implemented method for identifying a current purchaser of online transaction, comprising the steps of:

receiving an online transaction from a current purchaser, the online transaction including purchaser identification information;

5   generating from the online transaction a plurality of keys that individually do not reliably identify the current purchaser;

for each key, retrieving a profile summarizing a plurality of historical transactions associated with the key, each profile including a plurality of summary variables derived from the associated historical transactions; and

10   selecting as the profiles of the current purchaser the profiles having the most similar summary variables.

30.   (Currently Amended)   A system for processing online transactions, the system comprising:

15   a rule engine that receives from a scoring system a fraud score associated with a transaction, wherein said scoring system uses a summary variable in generation of said fraud score, the fraud score indicating the likelihood of fraud in the transaction, which applies a plurality of stored rules to the fraud score, each rule providing a condition and an action to perform in response to the transaction

20   or the fraud score, to determine according to the rules whether to approve or decline the transaction, request more information from the purchaser, or hold the transaction for review by a human analyst;

an outsort management workstation that receives from the rule engine transactions to be held for review, stores the transactions in queues, and

25   provides access to the queues to a human analyst in order to review transactions in the queues, the outsort management workstation further adapted to define for each queue at least one criteria for associating a transaction with the queue; and

a policy management workstation adapted to access the stored rules, and define rules for the rule engine to apply.

10

31.   (Original) A system for scoring a transaction, the system comprising:

a plurality of stored profiles, each profile associated with a key for one of a plurality of key fields of a transaction, the key fields including at least one key field that does not reliably identify a purchaser of a transaction, each profile including summary variables summarizing all transactions having a same key for at least one of the key fields; and

a statistical model that receives as inputs a transaction, a plurality of profiles, each profile summarizing transactions associated with a key for a key field, and at least one contrast measure that weights selected pairs of the profiles, and that produces a fraud score indicating the likelihood of fraud in the transaction.

32.   (Previously Presented) The system of Claim 31, wherein the at least one contrast measure is a ratio of the summary variables of a selected pair of profiles.

33.   (Currently Amended) A method for establishing a cutoff score for a transaction processing system that processes transactions of a merchant, comprising the steps of:

providing a statistical model built in a supervised learning environment, wherein said statistical model that generates a score categorizing a transaction, the score used by the merchant to accept or reject the transaction;

determining for each of a plurality of scores generated by the statistical model an actual transaction false positive rate;

determining a desired transaction false positive rate as a function of the merchant's net margin; and

11

setting the cutoff score for rejecting transactions as a score having an actual transaction false positive rate approximating or equal to the desired transaction false positive rate.

5   34.   (Previously Presented) The method of Claim 33, wherein determining a desired transaction false positive rate as a function of the merchant's net margin comprises the steps of:

setting the transaction false positive rate TFPR according to the equation:

$$TFRP = \frac{1\text{-Net Margin}}{\text{Net Margin}}$$

10   wherein Net Margin is the merchant's net margin.

35.   (Previously Presented) A computer implemented system for processing an online transaction, comprising:

means for receiving an online transaction from a current purchaser, the
15   online   transaction   including   purchaser   identification   information,   order information, and payment information;

means for generating from the online transaction a plurality of keys that individually do not reliably identify the current purchaser;

means for retrieving a profile summarizing a plurality of historical
20   transactions associated with the each key;

means for weighting each profile with a weight indicating a degree to which the profile is associated with current purchaser; and

means for generating a fraud score indicative of the likelihood of fraud in the online transaction as a function of the weighted profiles and the current
25   transaction.

12

36.   (Previously Presented) A system for developing a statistical model of online transactions, comprising:

a database for storing transactions from a plurality of different online merchants, the transactions for a plurality of different purchasers, each
5   transaction indicated as being fraudulent or non-fraudulent;

means for generating for each of a plurality of key fields of the transaction--including at least one key field for which all of the possible keys of the key field do not reliably uniquely identify a purchaser of the transaction—a profile for all of the transactions having a matching key for the key field, such that at least one
10   profile summarizes the transactions of a plurality of different individuals;

means for generating a contrast measure comparing the summary variables of at least two of the profiles; and

means for training a statistical model to generate a score for a transaction, the score indicative of a likelihood that the transaction is fraudulent, by using as
15   training inputs to the statistical model selected transactions, the profiles associated with the keys of the key fields of each selected transaction, and the contrast measures associated with the profiles.

37.   (Currently Amended) A system for processing online transactions, the
20   system comprising:

a rule engine having a function of determining whether to approve a transaction, decline the transaction, request more information from the purchaser of the transaction, or hold the transaction for review by a human analyst by way of receiving a fraud score for the transaction from a scoring system and applying
25   rules to the fraud score, wherein said scoring system uses a contrast measure in generation of said fraud score, wherein each rule defines a condition and an action to perform in response to the fraud score, to produce a determination for handling the transaction;

13

an outsort management workstation having a function of queuing transactions to be held for review and providing access to the queues to a human analyst in order to review transactions in the queues by way of receiving from the rule engine transactions to be held for review and storing the transactions in

5   queues, each queue having at least one criteria for storing a transaction in the queue, to produce a set of queues, each queue storing one or more transactions; and

a policy management workstation having a function of defining rules for the rule engine to apply, by way of providing access to the stored rules.

10

38.   (Previously Presented) The method of Claim 15, wherein said step of training a statistical model uses a supervised learning environment.

39.   (Previously Presented) The method of Claim 15, wherein said model

15   comprises any of:

a neural network; and

a regression model.

40.   (Previously Presented) The method of Claim 15, wherein said step of

20   training a statistical model further comprises the step of:

preprocessing said at least one key field.

41.   (Previously Presented) The method of Claim 29, wherein said summary variables describe historical purchasing behavior.

25

42.   (Previously Presented) The system of Claim 30, wherein said fraud score comprises:

14

a scaled score.

43.   (New) The system of Claim 30, wherein said scoring system further uses a contrast measure in addition to said summary variable in generation of said
5   fraud score.

44.   (New) The system of Claim 37, wherein said scoring system comprises use of a summary variable in generation of said fraud score.

10   45.   (New)   The method of Claim 33, further comprising the step of: preprocessing data input into said model.

46.   (New) The method of Claim 33, wherein said model is trained using a self-learning computerized system.

15

47.   (New) The method of Claim 33, wherein said model comprises use of a neural network.

48.   (New) The method of Claim 33, wherein said model comprises use of a
20   contrast measure.

49.   (New)   The method of Claim 33, wherein said model comprises a regression model.

15